

Solutions to Unique Challenges in Sustaining the Navy's Readiness at San Clemente Island Ranges

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Agenda

- Overview
- Evolutionary Policy Development for Range Sustainability Environmental Program Assessment (RSEPA)
- San Clemente Island (SCI) Range Condition Assessment (RCA)



F/A-18F Super Hornet
Courtesy of www.navy.mil

*Sustainability is the ability to meet mission requirements
while fulfilling environmental stewardship goals within economic constraints*

Evolutionary Policy Development

August 1999
DoDD 4715.11/4715.12
(U.S. Department of Defense Directive)

September 2003
Office of Secretary of Defense (OSD)
Interim Perchlorate Sampling Policy

May/July 2004
DoDD 4715.11/4715.12

November 2005
DoDI 4715.14
(U.S. Department of Defense Instruction)

January 2006
Policy on DoD Required
Actions Related to Perchlorate

Navy Operational Range Assessment Policy Development

Pre-2001

- Tactical Training Theater Assessment and Planning Program (TAP) created and Ranges to Readiness (R2R) Study completed
- Range Environmental Vulnerability Analysis (REVA) developed

2002-2003

- Prototype assessments conducted and REVA transformed into Range Sustainability Environmental Program Assessment (RSEPA) (Rev. 0) (Dec 2003)

2003-2004

- Conducted assessments and commenced changes to RSEPA based on lessons learned and changing guidance

2005-2006

- Continued assessments and revised RSEPA (Rev. 1) (Nov 2006):
 - Required five-year reviews
 - Predictive model validation required
 - Clarified definitions
 - Included requirements from DODI 4715.14
 - Required final approved reports be made available to the public and regulators

2007-2009

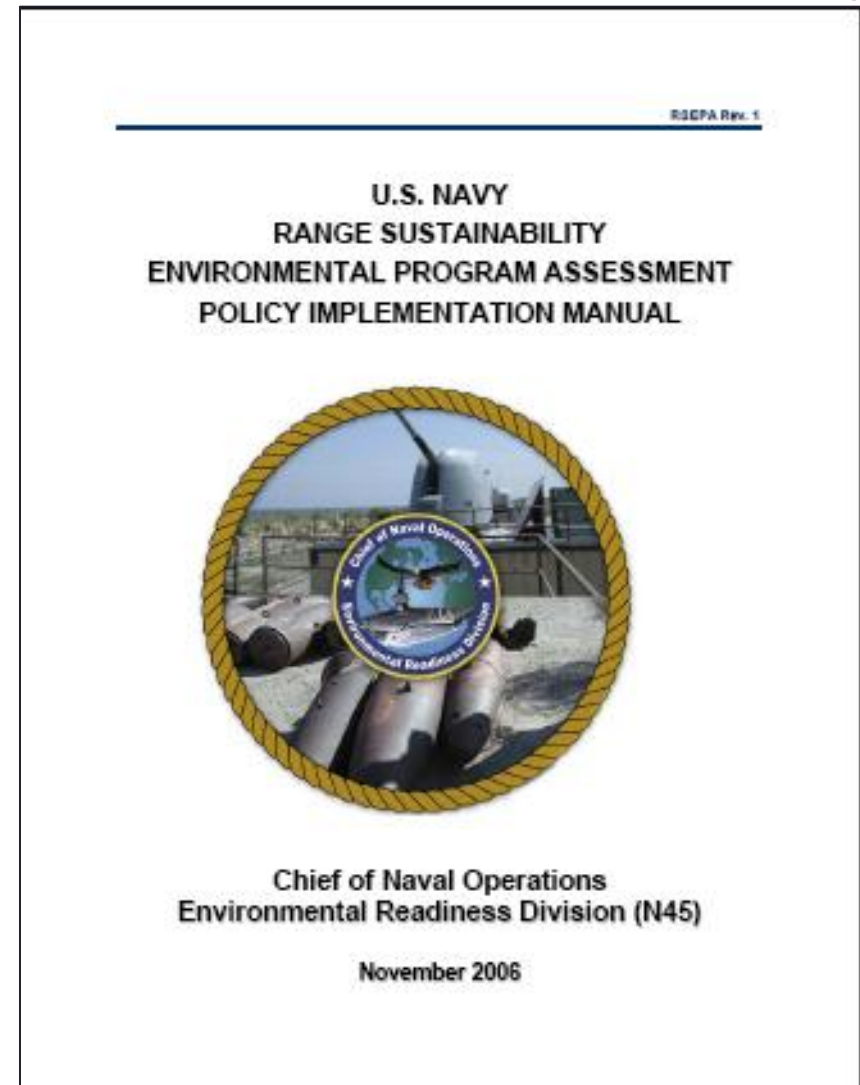
- Completed initial assessments and started five-year reviews
- Navy Policy for Conducting Operational Water Range Sustainability Environmental Program Assessments (WRSEPA) (Aug 2008)

Challenges for developing policy include the lack of other range sustainment implementation guidance and of the limited munitions constituents (MC) fate and transport data available in early 2000s

Range Sustainability

Environmental Program Assessments (RSEPA)

- Executes a range compliance management process to ensure long-term sustainability using a phased approach
 - Ensures compliance with applicable regulations
 - Identifies and assesses potential for off-range migration of munitions constituents (MCs) at land-based ranges
- Provides a technically defensible approach for assessing the environmental condition of land-based operational ranges
- Provides a framework for informed decisions about when and how to proceed with a comprehensive assessment and protective measures, if necessary



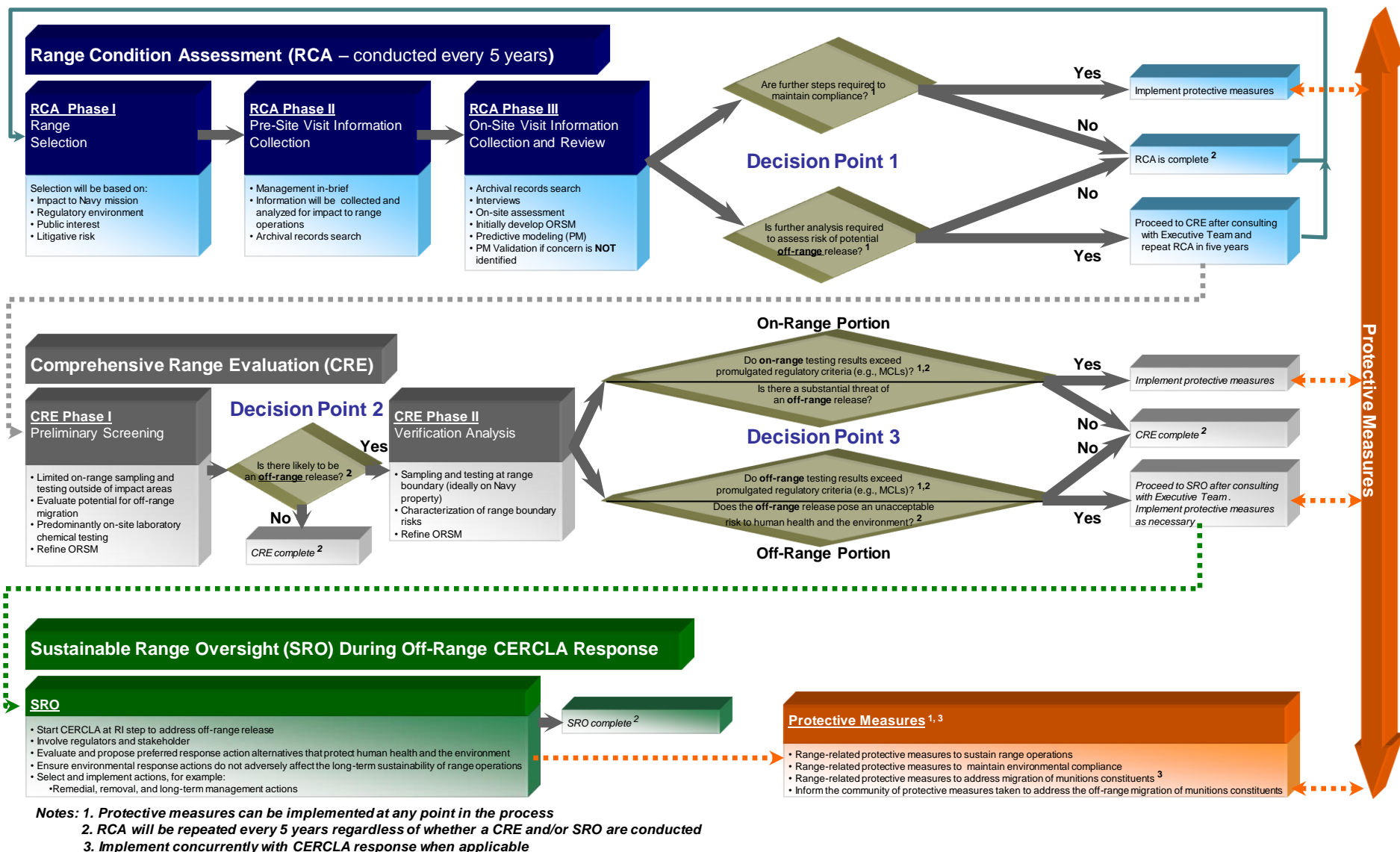
Range Sustainability

Environmental Program Assessments (RSEPA) Approach

- Range Condition Assessment (RCA)
 - An RCA is conducted to determine if steps are necessary to maintain compliance and to determine if further analysis is required to assess a risk of an off-range release. Review every five years.
- Comprehensive Range Evaluation (CRE)
 - If further analysis is required after the RCA, a CRE will be conducted to verify and confirm if an off-range release of MCs has occurred or if there is significant risk that an off-range release could occur. Conduct as needed.
- Sustainable Range Oversight During Off-Range Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA) Response (SRO)
 - An SRO is conducted in the event an off-range release has occurred. The focus of this phase is to ensure range sustainability is maintained while proceeding through the CERCLA process for off-range releases. Conduct as needed.

NAVY RANGE SUSTAINABILITY ENVIRONMENTAL PROGRAM ASSESSMENT (RSEPA)

Process Overview



Navy Operational Ranges

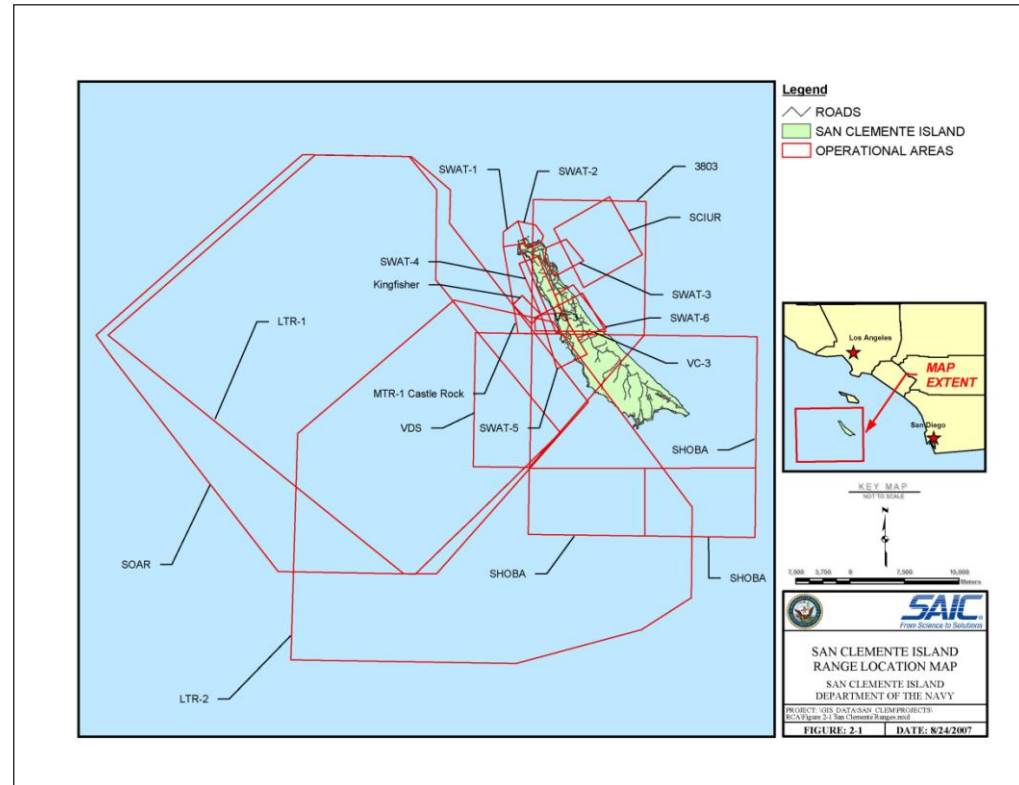
- 22 Navy range complexes (CONUS and OCONUS)
 - 11 training range complexes
 - 8 Research, Development, Test and Evaluation (RDT&E) range complexes
 - 3 overseas/U.S. territories range complexes



All Range Condition Assessments (RCAs) completed by the end of fiscal year 2008
Comprehensive Range Evaluations (CREs) conducted at three range complexes
Five-Year Reviews completed at three range complexes

San Clemente Island (SCI)

- Southernmost of eight California Channel Islands
- 50 nautical miles (nm) south of Long Beach, Calif., and 68 nm (126 kilometers) west of San Diego
- Approximately 18 nm long and 4 nm across at its widest point
- Controlled by Navy since 7 November 1934 under President Roosevelt's Executive Order
- Land- and water-based ranges and operations areas (OPAREAs)
- Maritime setting and proximity to mainland make it ideally situated and frequently used

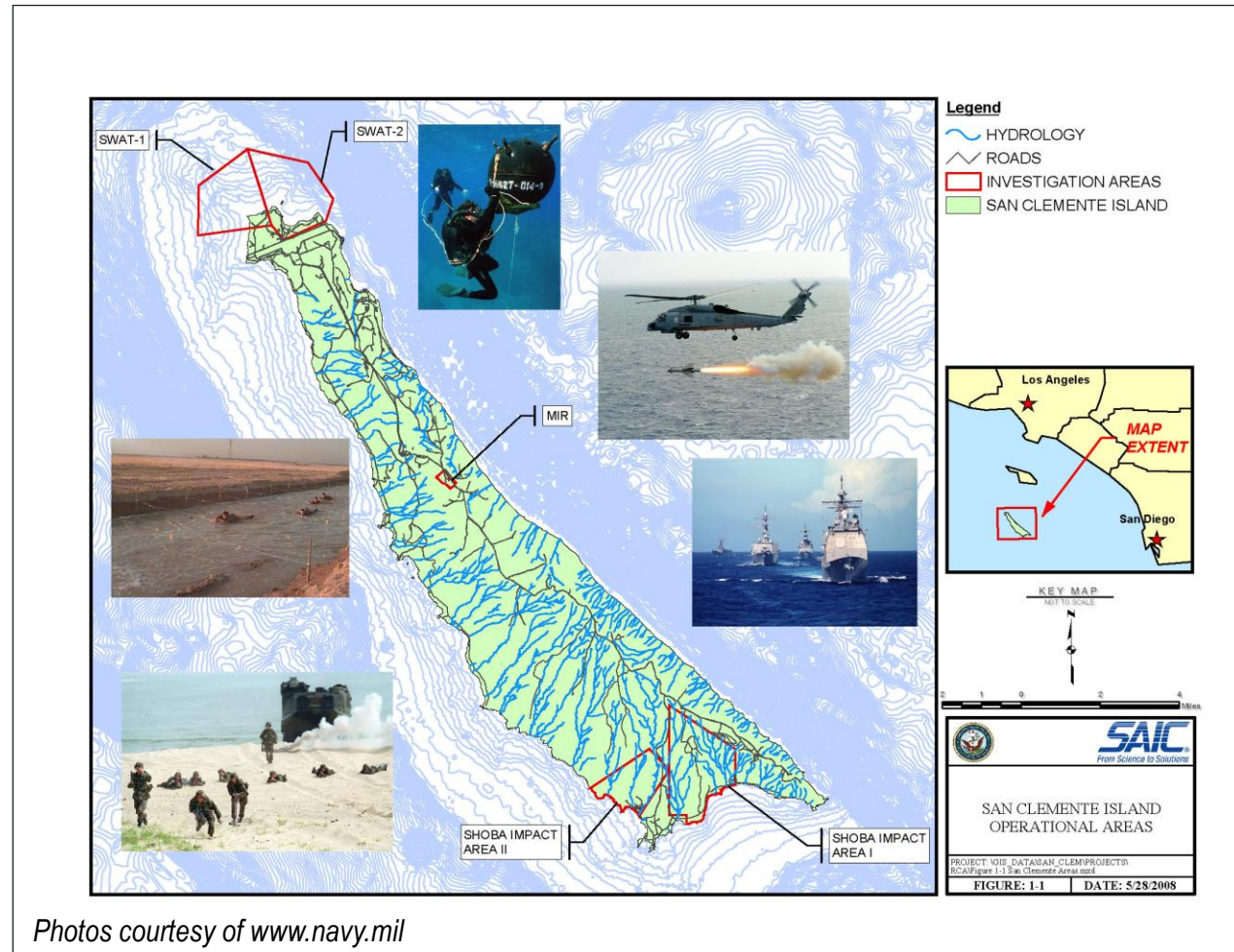


W-291 (Special Use Airspace) too big to depict

Due to its unique capabilities, SCI supports multiple training activities from every Navy Primary Mission Area (PMAR), and provides critical training resources for Expeditionary Strike Group (ESG), Carrier Strike Group (CSG), and Marine Expeditionary Unit (MEU) certification exercises

Summary of San Clemente Island (SCI) Operations

- Primarily training with air-to-ground bombs
- Also training with naval guns (small-, medium-, and large-caliber)
- Hosts U.S. Navy Sea, Air, and Land Service (SEAL) advanced and team training
- Available for Research, Development, Test and Evaluation (RDT&E) activities, but very few operations conducted in past few years



Challenges related to island setting of ranges situated in sensitive marine environment and establishing boundaries for “off-range release”

Summary of Land-Based Ranges with Munitions Usage

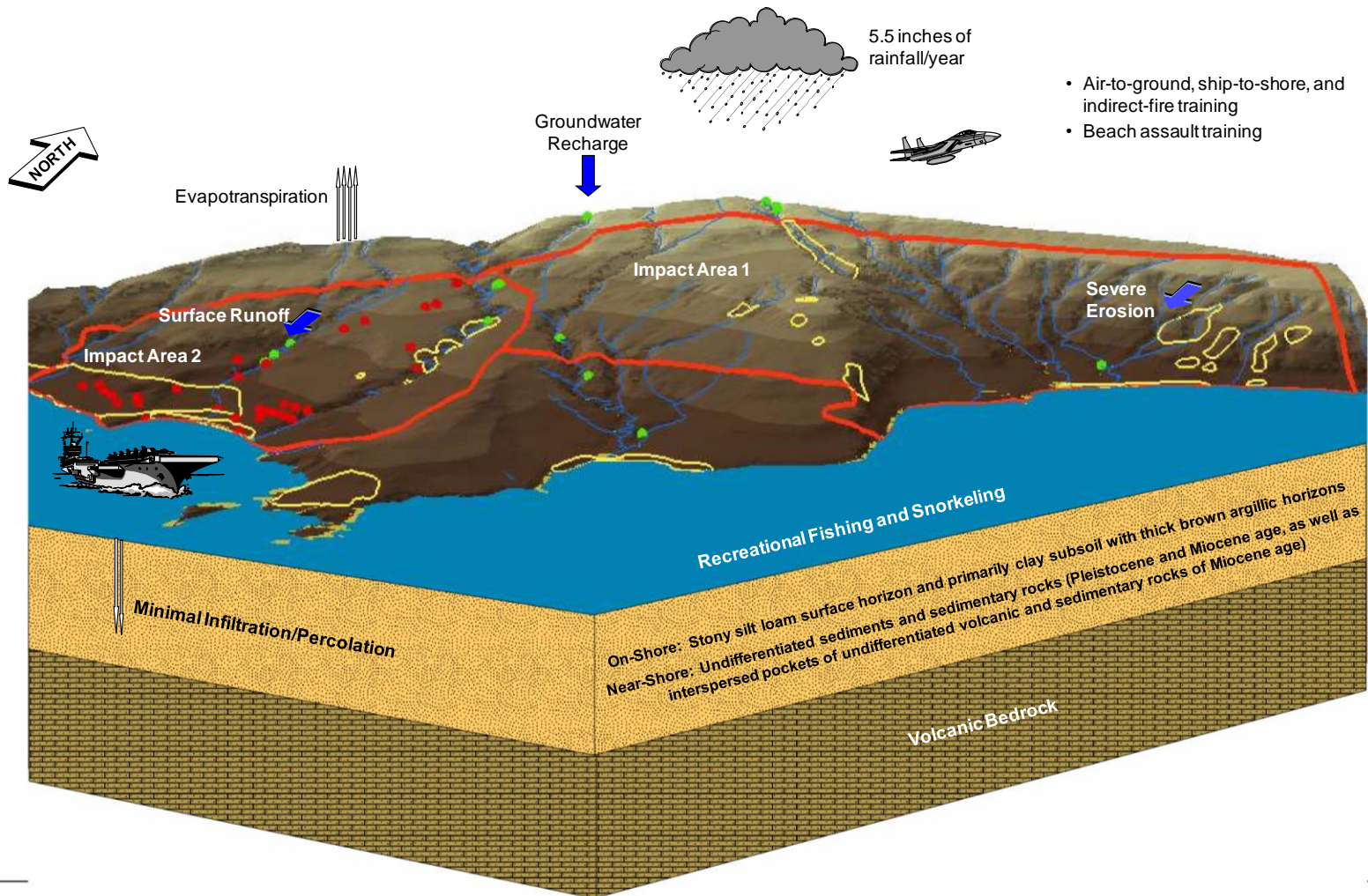
- **Special Warfare Training Areas (SWATs)**
 - Munition use limited to inert rounds and small quantities of explosives composition C4 and bulk 2,4,6-trinitrotoluene (TNT)
 - SWATs 1 through 6 used for Special Operations basic and advanced training
 - Demolition practice on land takes place in the existing bermed demolition range in SWAT 2 and, occasionally, in SWAT 1
 - Grenade explosions occur within a certified grenade range located in the Northwest Harbor area (SWAT 2)
- **Missile Impact Range (MIR)**
 - Developed as heavily instrumented, threat representative target set for research and developmental testing of missiles (for example, the Joint Standoff Weapon and the Tomahawk Land Attack Missile)
 - Equipped with multiple camera stations to record impacts and detonations of weapons
 - Contains fixed ground targets, including simulated structures and actual aircraft
 - No live munitions recorded fiscal year (FY) 01, FY02
 - Space and Warfare Systems Command (SPAWAR) recovers missile remains after each shot
- **Shore Bombardment Area (SHOBA)**
 - Two impact areas for live-fire and inert ordnance training exercises for ships, aircraft, and ground forces
 - Encompasses almost 14,000 acres with over 3,000 acres designated as impact areas (more than 2,000 acres for Impact Area I, 1,000 acres for Impact Area II, and 70 acres for the Bomb Box)
 - Small arms, air-to-ground weapons, surface-to-surface weapons, ship-to-shore, and other categories of munitions (such as surface-to-air, air-to-air)

Summary of Range Condition Assessment (RCA) – 2004

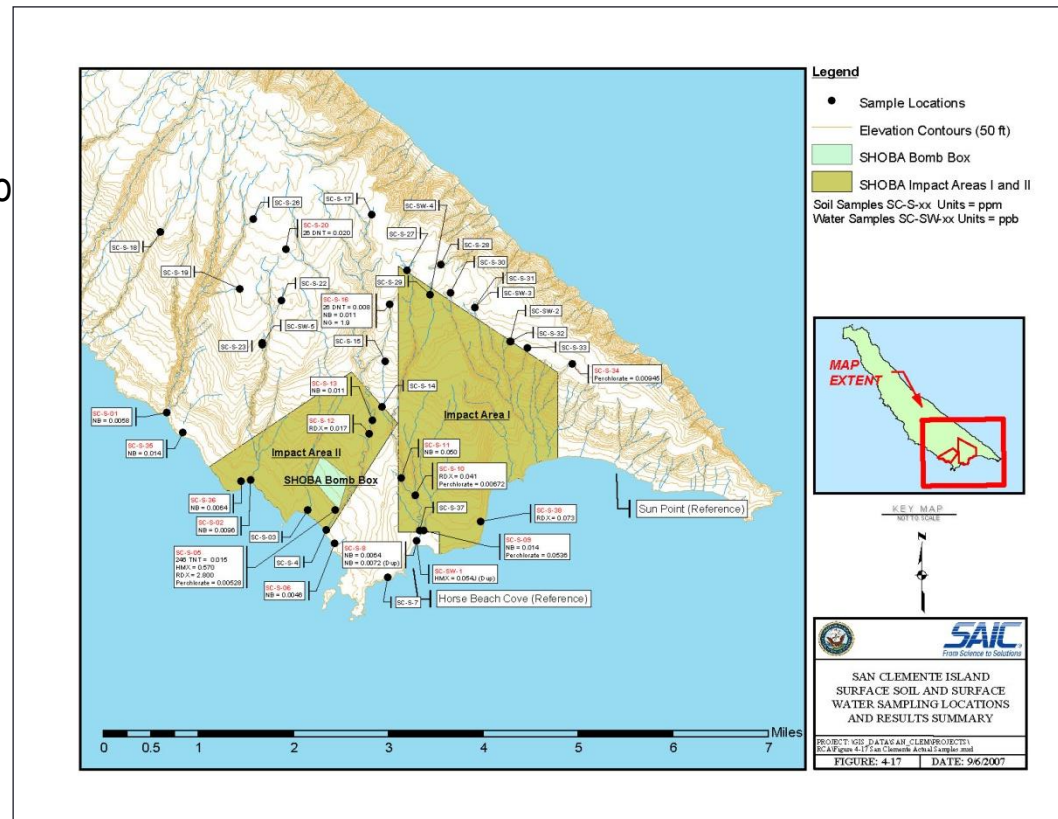
- Ranges complied with environmental laws, regulations, and self-imposed military requirements with few exceptions that were already in process of being addressed (for example, multi-year Environmental Impact Statement)
- Potential for migration from Special Warfare Training Areas (SWATs) 1 and 2, and Missile Impact Range (MIR) was considered unlikely
 - Limited munitions usage (few locations, limited quantities, few types) in the SWATs 1 and 2, and MIR
 - Predictive modeling not necessary
- More munitions usage at Shore Bombardment Area (SHOBA)
 - Operational range site models (ORSMs) indicated greatest potential for migration from SHOBA
 - Predictive modeling was conducted in RCA
 - Predictive modeling in SHOBA showed potential for dissolved munitions constituents (MCs) to migrate to land-water interface via overland flow
 - Modeling assumptions were known to be overly conservative (for example, concentrations at solubility limits, little/no degradation or adsorption), but there was no way to quantify the degree of conservatism or reduce the conservatism without additional data collection
 - Navy decisions: (1) site-specific media sampling in SHOBA to be collected during five-year review to provide more data to evaluate off-range migration potential and (2) policy revision needed to require predictive model validation if concern is NOT identified

Additional challenges for RCA at the time – Range Sustainability Environmental Program Assessments (RSEPA) policy development was in early phase and no other RCAs were completed or under way

Operational Range Site Model (ORSM) for Shore Bombardment Area (SHOBA)



- Collected 35 multi-incremental surface soil and five discrete surface water samples from Shore Bombardment Area (SHOBA) in March 2007 and analyzed all samples for perchlorate (SW6850) and explosives (SW8330B)
- Collected samples from various points in erosion channels running through SHOBA and into Pacific Ocean to determine if munitions constituents (MCs) are migrating to land/water interface
- Collected soil samples from the upper 2 inches or water samples from standing pools
- More sampling in Impact Area II than in Impact Area I due to access/safety issues, but Impact Area II used more heavily than Impact Area I (therefore, bias seems appropriate)
- Ensured sampling included down-gradient from Bomb Box and at land/water interface



Challenges for sampling included presence of sensitive munitions, hazardous work environment, restricted work schedules, limited accessibility, and transportation/shipping constraints

Summary of Five-Year Review (cont'd)

- Only seven munitions constituents (MCs) were detected: 2,6-dinitrotoluene (DNT); octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); nitrobenzene; nitroglycerin; perchlorate; hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX); and 2,4,6-trinitrotoluene (TNT)
- Only HMX was detected in any water sample and only detected in one sample (not detected in duplicate)
- Primary spatial trend observed in results was explosives detected in up- and mid-gradient sample locations with degradants detected in mid- and down-gradient sample locations (natural attenuation)
 - More compounds detected in samples collected at the land/water interface than mid- and up-gradient
 - Many of compounds detected at the land/water interface were degradation products
 - No explosives detected in samples downstream from the Bomb Box at the land/water interface, suggesting either complete degradation and/or limited mobility in the erosion channel



Most explosives were detected in SC-S-05



Location SC-S-36 was near the land-ocean interface



Location SC-S-32 illustrates all of the sampling increments



Location SC-SW-04 shows the typical amount of standing water in channels



SC-SW-01 was taken from this natural pool



Sample SC-S-14 was taken in mid-gradient zone

All detected concentrations fall below action levels established in the Field Sampling Plan

Conclusions

- Policy development challenges
 - Navy executed a proactive and evolutionary policy development approach to address the lacking range sustainment implementation guidance and limited munitions constituent (MC) fate and transport data in early 2000s
 - Navy continues to improve the assessments and policy implementation approaches through the discussion of issues, lessons learned, and newly available research and development results during semi-annual Range Sustainment Group meetings involving various Navy stakeholders
- Range Condition Assessment (RCA) and five-year review complexity challenges
 - Navy used lessons learned from other ranges and sampling during the five-year review to address lingering uncertainties and San Clemente Island (SCI) situational complexities
 - Navy focused sampling in predominant transport pathways to confirm the conservatism of predictive modeling and to show that natural attenuation (mechanical and biological) is effectively reducing concentrations of MCs and transforming MCs
- All data demonstrate no impacts to human health or the environment from Navy operations on the SCI ranges

Navy ensures that they meet environmental requirements and protect human health and the environment while minimizing impacts to operations at all 22 of their range complexes located worldwide